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lowing this with a statement of the principle of association, Mast continues:

Every step in the development of the theory is supported by numerous experimental facts and all seems to fit with what is known concerning the reactions of organisms. Reactions, according to the theory, are as stated above, primarily due to physiological states. External agents ordinarily produce reactions through the effect they have on these states. By the application of this idea all the different phenomena connected with reactions to light as summarized at the beginning of this chapter can be accounted for.

All this sounds rather naïve as compared with the critical exposition of the preceding part of the volume. It would indeed be comforting to be able to repose with such a spirit of confidence and contentment in a general philosophy of behavior, but it is perhaps pertinent to enquire if the author has not been deceived with the delusive appearance of explanation where no real explanation has been given. It is an obvious truism that external factors cause reactions by altering internal processes; else they would not be reactions at all. It is equally obvious that if changes of behavior occur where external conditions do not vary they must be due to the fact that internal conditions do vary; or, in other words, if the cause of a change is not outside of the organism it must perforce be inside of the organism. Phenomena may thus be "accounted for" on the basis of varying internal states, but as it is admitted that in most cases we are entirely ignorant of what these states are we are about as much enlightened as we are by the celebrated explanation of the sleep-producing effect of opium by attributing it to a dormitive principle.

There is a useful bibliography in which the effort is made to include all the important works on reactions to light in both animals and plants, but several noteworthy contributions are not included. Notwithstanding minor defects, the work of Mast will prove of great value to students of the effect of light on the behavior of organisms, and the author is to be congratulated on having made so substantial a contribution to the subject.

S. J. HOLMES

*A Laboratory Manual of Physical Geography.*

By R. S. TARR and O. D. VON ENGELN.  
New York, The Macmillan Company. 1910.

Tarr and von Engeln's "Laboratory Manual of Physical Geography" is the most practical and best organized manual that has yet appeared. Prepared as an exercise and notebook, with detachable leaves, and containing within its covers a large part of the necessary equipment for work, except for topographic maps, minerals and certain simple pieces of physical apparatus, it is a hand-book and guide available for both the expert and inexperienced teacher. Although primarily devoted to the study of physical geography, much emphasis is made of life relations and therefore the book not only meets a present condition, but makes possible a development of the phase of geography which is beginning to be emphasized by the better secondary school teachers.

Of the seventy-three exercises in the book, nine are devoted to the earth as a globe, seven to excursions, eight to minerals and rocks, five to map study, twenty-six to the physiography of the lands, two to the ocean, fourteen to the atmosphere and one each to life zones and magnetism.

Thus the special emphasis is good, though it is questionable whether mineral and rock study deserves to remain in physical geography and whether the ocean is not given too little emphasis. The larger life relations to the ocean, apart from the phenomena associated with ocean currents and tides, are so important and fascinating that it seems unreasonable to omit them, while space is given to minerals and to the physical phenomena of condensation. Laboratory work should be devoted to topics that are not capable of being learned more easily and more effectively through demonstration, and certainly condensation can not be included in this class.

The order of treatment under the land forms is original in that types of plains are studied in relation to drainage and not following drainage, and thus a better unity is preserved. Mountains are grouped according to

origin and presented in a similar all-round way. The later exercises under this head are listed according to their distribution in the United States and not primarily according to the class to which they belong.

Taken as a whole, however, the volume has few elements of weakness and many of strength. It has been tested in practise with beginning pupils and hence is not too advanced or specialized. It is a most valuable contribution to educational geography and ought to help strengthen and humanize physical geography teaching in our high schools, and it should be remembered that for many years such work has been unhuman, if not at times almost inhuman.

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*The Principles of Electro-deposition.* A laboratory guide to electro-plating. By SAMUEL FIELD, A.R.C.Sc. (Lond.), F.C.S. New York, Longmans, Green & Co. 1911, 12mo. Pp. xv + 383.

This is one of those manuals designed for the purpose of interesting further the purely technical worker, so that he may be led to learn something at least of the principles upon which the operations he observes daily are based.

After considering the apparatus for the production, regulation, and measurement of the electric current; plating with copper, nickel, iron, tin, zinc, silver, gold and brass are taken up in detail, from the theoretical as well as the practical viewpoint, the methods of preparing the object for plating, as well as the finishing, after that process is complete, also being considered. This is followed by several chapters on the methods for the qualitative and quantitative analysis of the substances employed in the various processes.

Whether the worker will actually gain the knowledge which the author hopes he may is a question, for much depends upon the elementary knowledge which can be assumed to be in the possession of the reader. One thing is quite certain, however,—the readers, or at

least some of them, will find their interest greatly aroused by a perusal of this book, even though it may not be thoroughly understood; with the result that they may be led to seek some school where a thorough training in the subject may be acquired. Books of this type are of the greatest value, for it is to them that we must look for the first step in that great advance in industrial work—the perfect combination of theory and practise.

J. L. R. M.

#### SCIENTIFIC JOURNALS AND ARTICLES

ANNOUNCEMENT is made of the establishment of *The Journal of the Washington Academy of Sciences*. It is to be a semi-monthly publication and will be sent to subscribers on the first and fifteenth of each month, or during the summer may appear on the fifteenth only, as double numbers. The first number will be issued about July 15, but after 1911 the volumes will correspond to the calendar year. The present *Proceedings of the Washington Academy of Sciences* will be discontinued after the completion of the current volume. The *Journal* will be a medium for the publication of original papers and a record of scientific work in Washington. It will accept for publication (1) brief papers written or communicated by resident or non-resident members of the academy; (2) abstracts of current scientific literature published in or emanating from Washington; (3) proceedings and programs of the affiliated societies, and (4) notes of events connected with the scientific life of Washington. The editors are: George K. Burgess, Bureau of Standards; Barton W. Evermann, Bureau of Fisheries, and Frederick Leslie Ransome, Geological Survey. Illustrations will be used only when necessary, and will be confined to text figures or diagrams of simple character. The editors, at their discretion may call upon an author to defray the cost of his illustrations, although no charge will be made for printing from a suitable cut supplied with the copy.

THE contents of the *Astrophysical Journal* for June are as follows: